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Serum Levels of Th2-Type Immunoglobulins are Increased in Weanling Mice Subjected to Acute Wasting Protein-Energy Malnutrition

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Abstract:

The bulk of our knowledge on immunosuppression in malnutrition comes from the experiments done on cell-mediated immunity. However, malnutrition-induced modifications of humoral immunity have been less understood. The objective of this study was to determine the effects of acute protein-energy malnutrition on serum levels of immunoglobulins and their subclasses in murine models. Male and female C57BL/6J mice were allocated to one of the four groups: (1) zero-time control (ZC) (19 days of age); (2) *ad libitum* intake of a complete purified diet (control group [CG]); (3) restricted intake of the complete diet (restricted group [RG]); and *ad libitum* intake of an isocaloric low-protein diet (low-protein group [LP]). The three groups other than the zero-time control were maintained on their respective regimens for 14 days, i.e. from 19 through 33 days of age. The restricted intake protocol produced weight loss through energy deficiency (marasmic-type malnutrition), whereas the low-protein diet caused wasting through inadequate protein nitrogen and induced a condition mimicking incipient kwashiorkor. Though serum levels of IgG1 and IgE (Th2-type immunoglobulins) in RG and LP mice were significantly higher than those in CG mice, serum levels of IgG2a and IgG3 (Th1-type immunoglobulins) did not show any significant difference between those three groups. Interestingly, serum levels of IgG2b (another Th2-type immunoglobulin) in LP mice were significantly higher than those in CG and RG mice. In ZC mice serum levels of total IgG, IgG1, IgG2b and IgG3 were significantly higher than those in the other three groups. We concluded that during acute malnutrition, Th1/Th2 balance is apparently shifted towards Th2 arm. This deviation seems to be more prominent during acute protein deficiency. The increased serum levels of immunoglobulins in ZC mice were probably due to the intestinal uptake of those proteins from maternal milk.

Keywords:

[Protein-energy malnutrition](#) , [Serum immunoglobulins](#)

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